

REMARKS

The Examiner's Action mailed on September 19, 2005, has been received and its contents carefully considered.

In this Amendment, Applicant has amended claims 1, 8 and 20, and added claims 21-23. Claims 1, 8 and 20 are the independent claims, and claims 1-6, 8-13, 17-23 remain pending in the application. For at least the following reasons, it is submitted that this application is in condition for allowance.

The Examiner's Action has rejected claims 1-6, 8-13 and 17-20 as being obvious over *Chuang et al.* (USP 6,001,709) in view of *Prabhakar* (USP 5,896,359). It is submitted that these claims are *prima facie* patentably distinguishable over the cited references for at least the following reasons.

Applicant's independent claim 1 is directed to a method of making a semiconductor device which includes, *inter alia*, passing oxygen ions into an upper surface of a pad oxide film, and out of a lower surface of the pad oxide film to implant the oxygen ions into selected parts of a silicon layer which are in direct contact with the lower surface of the pad oxide film, and which are directly under and completely covered by the pad oxide film. This claim further recites oxidizing the selected parts of the silicon layer, into which the oxygen ions have been implanted, and while the selected parts are still covered by the pad oxide film, to form isolation regions. Independent claims 8 and 20 recite similar features. This

claimed method mitigates the problems of lateral birds beak elongation of the field oxide films which isolate active elements, and abrupt vertical steps between the active element regions and field oxide regions, and is particularly advantageous when utilized with a fully depleted silicon-on-insulator device.

In contrast, *Chuang et al.* is directed to a modified LOCOS isolation process for semiconductor devices which includes, *inter alia*, a shielding layer which includes a pad oxide layer 21 and a silicon nitride layer 22. An opening 23 is formed in the nitride layer 22 and the pad oxide layer 21 to expose the semiconductor substrate 20. Oxygen ions are implanted through the opening 23, and into the substrate 20, as disclosed in column 3, lines 39 and 40, and as shown in Figure 2B.

The Examiner's Action has taken the position that the entire pad oxide film 21, including the opening 23, constitutes a pad oxide layer through which oxygen ions are implanted. Applicant has therefore amended independent claims 1, 8 and 20, to recite that the oxygen ions pass into an upper surface of the pad oxide film and out of the lower surface of the pad oxide film to implant the oxygen ions into selected parts of the silicon layer that are in direct contact with the lower surface of the pad oxide film, directly under and completely covered by the pad oxide film. In contrast, the cited reference does not disclose passing oxygen ions into an upper surface of the pad oxide film 21, and out of a lower surface of the pad oxide film 21, as recited by independent claims 1, 8 and 20. Moreover, the

parts of the substrate 20 which have the ions implanted therein are not in direct contact with a lower surface of the pad oxide film 21, nor are they completely covered by the pad oxide film 21, or directly under the pad oxide film 21, all as recited by Applicant's independent claims 1, 8 and 20.

Moreover, this reference discloses that the oxygen ions are implanted at a tilt angle to encourage oxidation in areas that are covered by the shielding layer. In contrast, one purpose served by the pad oxide film of the claimed invention is to hinder the diffusion of oxygen into unwanted areas so that any oxidation that may occur in these areas will be slight, as discussed in Applicant's specification on page 7, lines 6-12. Thus, Applicant's claimed invention has a different objective than the objectives of *Chuang et al.*

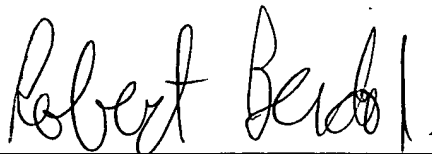
The Examiner's Action also relies on the teachings of *Prabhaker*. However, *Prabhaker* does not overcome the above-noted deficiencies of *Chuang et al.* As such, it is submitted that Applicant's independent claims 1, 8 and 20, and the claims dependent therefrom, are *prima facie* patentably distinguishable over the cited references, and it is thus requested that these rejections be withdrawn and that these claims be allowed.

It is submitted that this application is now in condition for allowance. Such action and the passing of this case to issue are requested.

Should the Examiner feel that a conference would help to expedite the prosecution of this application, the Examiner is hereby invited to contact the undersigned counsel to arrange for such an interview.

Should any fee be required, the Commissioner is hereby authorized to charge the fee to our Deposit Account No. 18-0002, and advise us accordingly.

Respectfully submitted,



December 6, 2005
Date

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